**ACTIVE SITE TUTORIALS**

**Date :** 07-09-2019 **TEST ID: 598**

**Time :** 08:57:00 **MATHEMATICS**

**Marks :** 519

1.DIFFERENTITATION

**Single Correct Answer Type**

| 1. | If and then at is | | | | | | | |
|  | a) |  | b) |  | c) | 0 | d) | None of these |
| 2. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 3. | Instead of the usual definition of derivative if we define a new kind of derivative, by the formula  where means  . If then  has the value | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 4. | The differential coefficient of with respect to where is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 5. | If then | | | | | | | |
|  | a) | 0 | b) | 1 | c) | 2 | d) | None of these |
| 6. | for whereis | | | | | | | |
|  | a) |  | b) | 0 | c) | 1 | d) |  |
| 7. | equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 8. | If then is equal to | | | | | | | |
|  | a) | for | | | b) | for | | |
|  | c) | for | | | d) | for | | |
| 9. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 10. | If then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 11. | Let then is | | | | | | | |
|  | a) | Equal to 0 | b) | Equal to 1 | c) |  | d) | Non-existent |
| 12. | If a polynomial of degree 3, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | A constant |
| 13. | If then is equal to | | | | | | | |
|  | a) |  | b) | log 2 | c) |  | d) | None of these |
| 14. | If then is equal to | | | | | | | |
|  | a) |  | b) | 1 | c) | 0 | d) | None of these |
| 15. | If then at is | | | | | | | |
|  | a) | 1 | b) | 2 | c) | In 2 | d) | None of these |
| 16. | If then at is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | 0 |
| 17. | If and then equals to | | | | | | | |
|  | a) | 12 | b) | 32 | c) | 36 | d) | 10 |
| 18. | If then at is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 19. | If , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 20. | Let be differentiable for all and let where is some constant. If and then the value of is | | | | | | | |
|  | a) | 5 | b) | 4 | c) | 3 | d) | 2.2 |
| 21. | If and then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 22. |  | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 23. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 24. | If then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 25. | If , then wherever it is defined is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 26. | If then the value at is | | | | | | | |
|  | a) | Positive | b) |  | c) | 0 | d) | None of these |
| 27. | If then the derivative of  atis | | | | | | | |
|  | a) | 2 | b) | 8 | c) | 16 | d) | 4 |
| 28. | If then | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 29. | If then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 30. | The th derivative of vanishes when | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 31. | The first derivative of the function  with respect to at is | | | | | | | |
|  | a) |  | b) | 0 | c) | 1/2 | d) |  |
| 32. | If then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 33. | A function satisfies the condition, where is a differentiable function indefinitely and dash denotes the order of derivative. If then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 34. | If then the value of is | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) | 5 | | | | | | | |
|  | d) | None of these | | | | | | | |
| 35. | If , then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 36. | If then is (where represents th derivative of w.r.t. ) | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 37. | A function defined for all positive real numbers, satisfies the equation for every Then the value of | | | | | | | |
|  | a) | 12 | | | b) | 3 | | |
|  | c) | 3/2 | | | d) | Cannot be determined | | |
| 38. | If then is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 39. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 40. | If then is a | | | | | | | |
|  | a) | function of | b) | function of | c) | function of | d) | constant |
| 41. | If and is the nth derivative of the  is | | | | | | | |
|  | a) | 1 | b) | 0 | c) |  | d) | None of these |
| 42. | Let g be the inverse of an invertible function which is differentiable for all real then equals | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) | None of these | | |
| 43. |  | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 44. | If then equals | | | | | | | |
|  | a) | for | b) | for | c) | for | d) | for |
| 45. | If and then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 46. | If then the derivative of with respect to is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 47. | If where then is | | | | | | | |
|  | a) |  | b) | zero | c) |  | d) |  |
| 48. | If satisfies the relation and  and then the period of sin is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 49. | The function being differentiable and one to one, has a differentiable inverse The value of at the point is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 50. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | 1 |
| 51. | If then | | | | | | | |
|  | a) |  | b) |  | c) | 3 | d) | 1 |
| 52. | If where then is | | | | | | | |
|  | a) | 1 | b) |  | c) | 0 | d) | None of these |
| 53. | If then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 54. | The th derivative of the function (where at the point where is even is | | | | | | | |
|  | a) | 0 | b) |  | c) |  | d) |  |
| 55. | If then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 56. | If than is | | | | | | | |
|  | a) | 2 | b) | 1 | c) | 0 | d) |  |
| 57. | If and is inverse of g, then g’ equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 58. | If g is the inverse function of and then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 59. | If then equal | | | | | | | |
|  | a) | where | | | b) | for and for | | |
|  | c) | for and for | | | d) | for and for | | |
| 60. | If then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 61. | If then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 62. | The derivative of with respect to at is | | | | | | | |
|  | a) | 1/8 | b) | 1/4 | c) | 1/2 | d) | 1 |
| 63. | If then at is | | | | | | | |
|  | a) |  | b) | 0 | c) |  | d) | None of these |
| 64. | Let be a quadratic expression which is positive for all the real values of If then for any real | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 65. | Suppose where and that for all Then the product is | | | | | | | |
|  | a) | 25 | b) | 9 | c) |  | d) |  |
| 66. | If then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 67. | If then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 68. | Let g is a twice differentiable positive function on such that is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 69. | Let In then the value of equals | | | | | | | |
|  | a) | 0 | b) |  | c) |  | d) |  |
| 70. | Let and be differentiable functions such that  If and then has the value equal to | | | | | | | |
|  | a) | 1 | b) | 0 | c) | 7 | d) |  |
| 71. | If is a continuous double differentiable function and is | | | | | | | |
|  | a) | 0 | b) | 5 | c) | 10 | d) | 25 |
| 72. | then at is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 73. | Suppose the function has the derivative 5 at and derivative7 at The derivative of the function at has the value equal to | | | | | | | |
|  | a) | 19 | b) | 9 | c) | 17 | d) | 14 |
| 74. | If then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 75. | is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 76. | Let and then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 77. | If In then the value of at is | | | | | | | |
|  | a) | 0 | b) | 6 | c) | 12 | d) | 24 |
| 78. | then the least value of for which is non-zero is | | | | | | | |
|  | a) | 5 | b) | 6 | c) | 7 | d) | 8 |
| 79. | Let g be the inverse of an invertible function which is differentiable at then equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 80. | The derivative of at is | | | | | | | |
|  | a) | 0 | b) |  | c) |  | d) |  |
| 81. | If then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 82. | If then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 83. | If then equals to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 84. | If graph of is symmetrical about -axis and that of is symmetrical about the origin. If then at is | | | | | | | |
|  | a) | Cannot be determined | | | b) |  | | |
|  | c) | 0 | | | d) | None of these | | |
| 85. | If then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 86. | If then is | | | | | | | |
|  | a) | a constant | b) | a function of only | c) | a function of only | d) | a function of and |
| 87. | If and then at is | | | | | | | |
|  | a) | 2 | b) | 1 | c) |  | d) | None of these |
| 88. | If and then | | | | | | | |
|  | a) | 0 | b) | 1 | c) |  | d) | None of these |
| 89. | If and and and given that then is | | | | | | | |
|  | a) | 5 | b) | 10 | c) | 0 | d) | 15 |
| 90. | If then at is | | | | | | | |
|  | a) | 1 | b) |  | c) |  | d) | None of these |
| 91. | Let where is a constant. Then at is | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) | Independent of | | | | | | | |

**Multiple Correct Answers Type**

| 92. | If for all and then is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) | None of these | | |
| 93. | If then is | | | | | | | |
|  | a) | for all | b) | for all | c) | for | d) | None of these |
| 94. | If , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 95. | then which of the following is/are true | | | | | | | |
|  | a) | for | | | | | | | |
|  | b) | for | | | | | | | |
|  | c) | for | | | | | | | |
|  | d) | None of these | | | | | | | |
| 96. | If | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) | does not exist | | | d) | does not exist | | |
| 97. | If and then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 98. | If 1 is a twice repeated root of the equation then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 99. | Differential coefficient of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 100. | If and then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 101. | If 1 is a twice repeated root of the equation , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 102. | Let then | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) | Domain of is | | | d) | Range of is | | |
| 103. | If , then | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 104. | Which of the following is/are true? | | | | | | | |
|  | a) | for where is | | | | | | | |
|  | b) | for where is 1 | | | | | | | |
|  | c) | for where is | | | | | | | |
|  | d) | for where is | | | | | | | |
| 105. | If and are in A.P. for all and then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 106. | If , then is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 107. | Let , then is equals to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 108. | Let .Then, | | | | | | | |
|  | a) | has a value 0, when | | | b) | Has a value 0, when | | |
|  | c) | Has a value when | | | d) | Has a differential coefficient , when | | |
| 109. | be a continuous function satisfying If then | | | | | | | |
|  | a) | is unbounded | b) |  | c) |  | d) |  |

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| **Assertion - Reasoning Type** | | | |
| This section contain(s) 0 questions numbered 110 to 109. Each question containsstatement 1(Assertion) and statement 2(Reason). Each question has the 4 choices (a), (b), (c) and (d) out of which **only one** is correct. | | | |
|  | a) | Statement 1 is True, Statement 2 is True; Statement 2 **is** correct explanation for Statement 1 | |
|  | b) | Statement 1 is True, Statement 2 is True; Statement 2 **is not** correct explanation for Statement 1 | |
|  | c) | Statement 1 is True, Statement 2 is False | |
|  | d) | Statement 1 is False, Statement 2 is True | |

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| --- | --- | --- | --- |
| 110 |  | | |
|  | **Statement 1:** | | If ,  =4,then |
|  | **Statement 2:** | | If , then the derivation of with respect to is |

|  |  |  |  |
| --- | --- | --- | --- |
| 111 |  | | |
|  | **Statement 1:** | | Let is a real-valued function such that then is a constant function |
|  | **Statement 2:** | | If derivative of the function w.r.t. is zero, then function is constant |

|  |  |  |  |
| --- | --- | --- | --- |
| 112 |  | | |
|  | **Statement 1:** | | If differentiable function satisfies the relation and if then |
|  | **Statement 2:** | | is a periodic function with period 4 |

|  |  |  |  |
| --- | --- | --- | --- |
| 113 |  | | |
|  | **Statement 1:** | | Derivative of with respect to is 1 for |
|  | **Statement 2:** | | for |

|  |  |  |  |
| --- | --- | --- | --- |
| 114 |  | | |
|  | **Statement 1:** | | For |
|  | **Statement 2:** | | For |

|  |  |  |  |
| --- | --- | --- | --- |
| 115 |  | | |
|  | **Statement 1:** | | For |
|  | **Statement 2:** | | For |

|  |  |  |  |
| --- | --- | --- | --- |
| 116 | If for some differentiable function and | | |
|  | **Statement 1:** | | Then sign of does not change in the neighborhood of |
|  | **Statement 2:** | | is repeated root of |

|  |  |  |  |
| --- | --- | --- | --- |
| 117 | Observe the following statements  Which of the following is correct? | | |
|  | **Statement 1:** | | I |
|  | **Statement 2:** | | II |

|  |  |  |  |
| --- | --- | --- | --- |
| 118 |  | | |
|  | **Statement 1:** | | If , then |
|  | **Statement 2:** | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 119 |  | | |
|  | **Statement 1:** | | Let and denotes greatest integral function, when is not an integral, then rule for is given by |
|  | **Statement 2:** | | does not exist for any integer |

|  |  |  |  |
| --- | --- | --- | --- |
| 120 |  | | |
|  | **Statement 1:** | | If is an odd function, then is an even function |
|  | **Statement 2:** | | If is an even function, then is an odd function |

|  |  |  |  |
| --- | --- | --- | --- |
| 121 | Consider function satisfies the relation, and differentiable for all | | |
|  | **Statement 1:** | | If then |
|  | **Statement 2:** | | is an odd function |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Matrix-Match Type** | | | | | | | | | |
| This section contain(s) 0 question(s). Each question contains Statements given in 2 columns which have to be matched. Statements (A, B, C, D) in **columns I** have to be matched with Statements (p, q, r, s) in **columns II**. | | | | | | | | | |

| 122. |  | | | | | | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Column-I** | | | **Column- II** | | | |
|  | **(A)** | be givin by and  then at | | (p) | | 0 | |
|  | **(B)** | be a polynomial of degree 4, with and then | | (q) | |  | |
|  | **(C)** |  | | (r) | | 2 | |
|  | **(D)** | and and then | | (s) | |  | |
|  | **CODES :** | | | | | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **A** | **B** | **C** | **D** |  |  |
|  | **a)** | P | q | r | s |  |  |
|  | **b)** | q | r | s | p |  |  |
|  | **c)** | t | r | s | p |  |  |
|  | **d)** | s | t | p | q |  |  |

| 123. |  | | | | | | | | |

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Column-I** | | | **Column- II** | | | |
|  | **(A)** | Differentiable function satisfies the relationfor all | | (p) | | Graph of is symmetrical about point (1,0) | |
|  | **(B)** | Differentiable function satisfies the relation for all | | (q) | | Graph of is symmetrical about line | |
|  | **(C)** | Differentiable function satisfies the relation for all | | (r) | |  | |
|  | **(D)** | Differentiable function satisfies the relation for all and | | (s) | | has period 4 | |
|  | **CODES :** | | | | | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **A** | **B** | **C** | **D** |  |  |
|  | **a)** | P | q,r | s,r | q,r |  |  |
|  | **b)** | q | p,s | t,r | q |  |  |
|  | **c)** | s | q,r | p,s | t |  |  |
|  | **d)** | s,r | t | q | p,q |  |  |

| 124. |  | | | | | | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Column-I** | | | **Column- II** | | | |
|  | **(A)** | then | | (p) | | For | |
|  | **(B)** | then | | (q) | | For | |
|  | **(C)** | then | | (r) | | For | |
|  | **(D)** | then | | (s) | | For | |
|  | **CODES :** | | | | | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **A** | **B** | **C** | **D** |  |  |
|  | **a)** | T | r | s,r | p |  |  |
|  | **b)** | s,p | t | p | q |  |  |
|  | **c)** | q,r | p,r,s | q,s | q,r |  |  |
|  | **d)** | q | r,q | s | p |  |  |

| 125. | Match the value of in column II where derivative of the function in column I is negative | | | | | | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Column-I** | | | **Column- II** | | | |
|  | **(A)** |  | | (p) | | (1, 2) | |
|  | **(B)** |  | | (q) | |  | |
|  | **(C)** | where [.] represents greatest integer function | | (r) | |  | |
|  | **(D)** |  | | (s) | |  | |
|  | **CODES :** | | | | | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **A** | **B** | **C** | **D** |  |  |
|  | **a)** | P,q,r | q,s | q,r | r |  |  |
|  | **b)** | s,r | t,s | p | q |  |  |
|  | **c)** | t | r | s | p |  |  |
|  | **d)** | t,q | p | r | s |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Linked Comprehension Type**  This section contain(s) 14 paragraph(s) and based upon each paragraph, multiple choice questions have to be answered. Each question has atleast 4 choices (a), (b), (c) and (d) out of which **only one** is correct.  **Paragraph for Question Nos. 126 to -126** | | | | | | | | |
| If D\*fx=limh→0f2x+h-f2(x)h, where f2x=fx2On the basis of above information, answer the following questions : | | | | |

| 126. | If , then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| **Paragraph for Question Nos. 127 to - 127** | | | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| If y=f(x)be a differentiable function of x such whose second, third,…, nth derivatives exist.ie,nth derivative of y is denoted byyn'dnydxn,Dyn,yn,fn(x)⇒dnydxn=limh→0fn-1x+h-fn-1(x)hOn the basis of above information, answer the following question : | | | | |

| 127. | If then the value of is | | | | | | | |
|  | a) | 1 | b) |  | c) |  | d) |  |
| **Paragraph for Question Nos. 128 to - 128** | | | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| f(x) is a polynomial function f:R→R such that f2x=f'xf"(x) | | | | |

| 128. | The value of is | | | | | | | |
|  | a) | 4 | b) | 12 | c) | 15 | d) | None of these |
| **Paragraph for Question Nos. 129 to - 129** | | | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| f:R→R,fx=x3+x2f'1+xf''2+f'''(3) for all x∈R | | | | |

| 129. | The value of is | | | | | | | |
|  | a) | 2 | b) | 3 | c) |  | d) | 4 |
| **Paragraph for Question Nos. 130 to - 130** | | | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Repeated roots: if equation fx=0, where f(x) is a polynomial function, and if it has roots α,α,β,… or α root is repeated root, then fx=0 is equivalent to x-α2x-β…=0, from which we can conclude that f'x=0 or 2x-αx-β…+x-α2x-β…'=0 or x-α2x-β…+x-αx-β…'=0 has root α. Thus, if α root occurs twice in equation , then it is common in equations fx=0 and f'x=0Similarly, if α root occurs thrice in equation, then it is common in the equations fx=0,f'x=0 and f"(x)=0 | | | | |

| 130. | If is a factor of order of the polynomial of degree then is a root of the polynomial (where represent th derivative of w.r.t.) | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| **Paragraph for Question Nos. 131 to - 131** | | | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Equation xn-1=0,n>1,n∈N, has roots 1,a1,a2…,an-1 | | | | |

| 131. | The value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| **Paragraph for Question Nos. 132 to - 132** | | | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| fx=x2+xg'1+g"(2) and gx=f1x2+xf'x+f"(x) | | | | |

| 132. | The value of is | | | | | | | |
|  | a) | 1 | b) | 0 | c) |  | d) |  |
| **Paragraph for Question Nos. 133 to - 133** | | | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| gx+y=gx+gy+3xyx+y∀ x, y∈R and g'0=-4 | | | | |

| 133. | Number of real roots of the equation is | | | | | | | |
|  | a) | 2 | b) | 0 | c) | 1 | d) | 3 |
| **Paragraph for Question Nos. 134 to - 134** | | | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A curve is represented parametrically by the equations x=ft=aIn(bt) and y=gt=b-Inata,b>0 and a≠1, b≠1 where t∈R | | | | |

| 134. | Which of the following is not a correct expression for | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |

**Integer Answer Type**

| 135. | is | | | | | | | |
| 136. | Suppose where and that for all Then the value of is | | | | | | | |
| 137. | Let and then the value of is | | | | | | | |
| 138. | If and at then the value of is | | | | | | | |
| 139. | Let If exists and is equal to non-zero value , then is equal to | | | | | | | |
| 140. | If is an odd differentiable function defined on such that then equals | | | | | | | |
| 141. | If and for all Also and Then the value of is | | | | | | | |
| 142. | where satisfies the relation and then is equal to | | | | | | | |
| 143. | Suppose that and and let The value of is equal to | | | | | | | |
| 144. | Let and Then the value of at is | | | | | | | |
| 145. | A non-zero polynomial with real coefficients has the property that If is the leading coefficient of then the value of is | | | | | | | |
| 146. | If function satisfies the relation for all and now if then the value of is | | | | | | | |
| 147. | A function is represented parametrically by the equations then the value of is | | | | | | | |
| 148. | Let g where is a twice differentiable function on such that The value of equals | | | | | | | |
| 149. | If graph of is symmetrical about the point (5, 0) and then the value of is | | | | | | | |
| 150. | Let and then the value of is | | | | | | | |
| 151. | If the function and then the reciprocal of is | | | | | | | |
| 152. | If is one of the form then positive value of is | | | | | | | |

**ACTIVE SITE TUTORIALS**

**Date :** 07-09-2019 **TEST ID: 598**

**Time :** 08:57:00 **MATHEMATICS**

**Marks :** 519

1.DIFFERENTITATION

|  |
| --- |
| **: ANSWER KEY :** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **1) a 2) b 3) c 4) c**  **5) a 6) a 7) d 8) c**  **9) b 10) a 11) a 12) c**  **13) c 14) c 15) d 16) a**  **17) d 18) a 19) b 20) c**  **21) c 22) d 23) c 24) d**  **25) b 26) a 27) c 28) a**  **29) a 30) c 31) a 32) b**  **33) a 34) c 35) b 36) a**  **37) b 38) c 39) a 40) d**  **41) b 42) a 43) d 44) b**  **45) a 46) d 47) b 48) b**  **49) b 50) b 51) a 52) a**  **53) a 54) b 55) c 56) c**  **57) c 58) a 59) b 60) b**  **61) c 62) b 63) c 64) b**  **65) c 66) b 67) a 68) a**  **69) a 70) a 71) b 72) b**  **73) a 74) a 75) b 76) c**  **77) a 78) c 79) b 80) b**  **81) a 82) c 83) b 84) a**  **85) b 86) a 87) a 88) b**  **89) a 90) b 91) d 1) a,c 2) b,c 3) a,c 4) a,b,c**  **5) b,c 6) b,c 7) b,c,d 8) a**  **9) a,c 10) b,c,d 11) a,b,d 12) a,b,c**  **13) a,b,c 14) a,c 15) b,d 16) a,c,d**  **17) b,c,d 18) a,c,d 1) a 2) a 3) a 4) c**  **5) b 6) d 7) d 8) a**  **9) a 10) a 11) c 12) a**  **1) b 2) a 3) c 4) a**  **1) b 2) c 3) b 4) d**  **5) b 6) b 7) b 8) d**  **9) d 1) 2 2) 5 3) 3 4) 5**  **5) 7 6) 2 7) 9 8) 9**  **9) 6 10) 5 11) 9 12) 3**  **13) 1 14) 2 15) 3 16) 8**  **17) 5 18) 5** | | | | |

**ACTIVE SITE TUTORIALS**

**Date :** 07-09-2019 **TEST ID: 598**

**Time :** 08:57:00 **MATHEMATICS**

**Marks :** 519

1.DIFFERENTITATION

|  |
| --- |
| **: HINTS AND SOLUTIONS :** |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | **(a)**  Let  Then  At  Then  Differentiating w.r.t. and  At i.e | | | | | | | |
| 2 | **(b)** | | | | | | | |
| 3 | **(c)** | | | | | | | |
| 4 | **(c)** | | | | | | | |
| 5 | **(a)**  Differentiating both sides w.r.t. we get | | | | | | | |
| 6 | **(a)** | | | | | | | |
| 7 | **(d)**  Since, | | | | | | | |
| 8 | **(c)** | | | | | | | |
| 9 | **(b)** | | | | | | | |
| 10 | **(a)** | | | | | | | |
| 11 | **(a)**  Let  Hence, | | | | | | | |
| 12 | **(c)**  We have where is a polynomial of degree 3 and hence thrice differentiable,  Then (1)  Differentiate(1) w.r.t. we get  (2)  Again differentiate w.r.t. we get  [Using (2)]  [Using(1)]  Again differentiating with respect to we get | | | | | | | |
| 13 | **(c)**  (On simplification) | | | | | | | |
| 14 | **(c)**  Again | | | | | | | |
| 15 | **(d)** | | | | | | | |
| 16 | **(a)**  Now | | | | | | | |
| 17 | **(d)**  Now, (1)  (2)  Now  From (1) and (2), | | | | | | | |
| 18 | **(a)**  Differentiating w.r.t. , we have | | | | | | | |
| 19 | **(b)** | | | | | | | |
| 20 | **(c)** | | | | | | | |
| 21 | **(c)** | | | | | | | |
| 22 | **(d)**  Put | | | | | | | |
| 23 | **(c)**  (1)  Again,  Substituting the value of from (1) | | | | | | | |
| 24 | **(d)**  We have  , on putting  Differentiating w.r.t. | | | | | | | |
| 25 | **(b)** | | | | | | | |
| 26 | **(a)**  In the neighbourhood of we have | | | | | | | |
| 27 | **(c)** | | | | | | | |
| 28 | **(a)**  Differentiating w.r.t. we get | | | | | | | |
| 29 | **(a)**  So, | | | | | | | |
| 30 | **(c)**  …  …  Now, | | | | | | | |
| 31 | **(a)** | | | | | | | |
| 32 | **(b)** | | | | | | | |
| 33 | **(a)**  Given  Hence,  Also, | | | | | | | |
| 34 | **(c)** | | | | | | | |
| 35 | **(b)** | | | | | | | |
| 36 | **(a)**  We have | | | | | | | |
| 37 | **(b)** | | | | | | | |
| 38 | **(c)** | | | | | | | |
| 39 | **(a)** | | | | | | | |
| 40 | **(d)**  Differentiating with respect to we get  Now,  and  So,  constant | | | | | | | |
| 41 | **(b)** | | | | | | | |
| 42 | **(a)**  Given that or | | | | | | | |
| 43 | **(d)**  Let | | | | | | | |
| 44 | **(b)** | | | | | | | |
| 45 | **(a)** | | | | | | | |
| 46 | **(d)**  Let and  (1)  and (2)  Hence, (from(1) and (2)) | | | | | | | |
| 47 | **(b)** | | | | | | | |
| 48 | **(b)**  Given  which satisfies section formula for abscissa on L.H.S. and ordinate on R.H.S. Hence, must be the linear function (as only straight line satisfies such section formula)  But  Thus, Period of is | | | | | | | |
| 49 | **(b)** | | | | | | | |
| 50 | **(b)**  Let  Put | | | | | | | |
| 51 | **(a)** | | | | | | | |
| 52 | **(a)**  Let then  So,  is in the first or the second quadrant) | | | | | | | |
| 53 | **(a)**  Let  Then | | | | | | | |
| 54 | **(b)**  where  where is even | | | | | | | |
| 55 | **(c)**  We have  Differentiating w.r.t. we get | | | | | | | |
| 56 | **(c)**  We have | | | | | | | |
| 57 | **(c)**  Differentiating, we get | | | | | | | |
| 58 | **(a)**  Since g is the inverse function of we have | | | | | | | |
| 59 | **(b)**  For we have  For we have  For we have  For we have  Hence, | | | | | | | |
| 60 | **(b)** | | | | | | | |
| 61 | **(c)** | | | | | | | |
| 62 | **(b)**  Let and  Putting in we get  Putting in we get  Thus, | | | | | | | |
| 63 | **(c)**  In neighbourhood of and  At | | | | | | | |
| 64 | **(b)**  Let  As given that  and (1)  Now,  Here  Also from(1), | | | | | | | |
| 65 | **(c)**  and  and  orand or  hence and  Or and | | | | | | | |
| 66 | **(b)**  We have Therefore, | | | | | | | |
| 67 | **(a)** | | | | | | | |
| 68 | **(a)**  Since,  and  …(i)  Replacing by , we get  …(ii)  On substituting, in Eq. (ii) and adding, we get | | | | | | | |
| 69 | **(a)**  In  Now | | | | | | | |
| 70 | **(a)**  (given)  Again  Now | | | | | | | |
| 71 | **(b)**  Given,  and …(i)  Now,    [using Eq.(i)]  is a constant | | | | | | | |
| 72 | **(b)**  Now, put | | | | | | | |
| 73 | **(a)**  and (1)  (2)  Now let  (3)  Substituting the value of in we get | | | | | | | |
| 74 | **(a)**  Differentiating w.r.t. we get  [by(1)] | | | | | | | |
| 75 | **(b)** | | | | | | | |
| 76 | **(c)**  Here, and  So,  Differentiate both sides w.r.t. we get  Again, differentiate both sides w.r.t., we get | | | | | | | |
| 77 | **(a)**  As is odd, is even  at | | | | | | | |
| 78 | **(c)**  Clearly, is non-zero | | | | | | | |
| 79 | **(b)**  Since is the inverse of function therefore for all  Now  (putting | | | | | | | |
| 80 | **(b)**  At | | | | | | | |
| 81 | **(a)**  Differentiating both sides w.r.t. we get  Again differentiating w.r.t. we get | | | | | | | |
| 82 | **(c)** | | | | | | | |
| 83 | **(b)**  From the given relation  Differentiating w.r.t. we get  (1)  Differentiating again w.r.t. we get  [by(1)] | | | | | | | |
| 84 | **(a)**  is an even function and is an odd function  is an odd function  Now, we cannot determine the value of (0) | | | | | | | |
| 85 | **(b)**  Putting and | | | | | | | |
| 86 | **(a)**  Constant | | | | | | | |
| 87 | **(a)**  At | | | | | | | |
| 88 | **(b)**  We have and | | | | | | | |
| 89 | **(a)**  Here  and  So  is a constant function | | | | | | | |
| 90 | **(b)**  at | | | | | | | |
| 91 | **(d)**  Given where is constant  = Independent of | | | | | | | |
| 92 | **(a,c)**  …  Use and | | | | | | | |
| 93 | **(b,c)** | | | | | | | |
| 94 | **(a,c)** | | | | | | | |
| 95 | **(a,b,c)** | | | | | | | |
| 96 | **(b,c)** | | | | | | | |
| 97 | **(b,c)**  and | | | | | | | |
| 98 | **(b,c,d)**  1 is a root of and or  1 is a root of (1)  (2)  and | | | | | | | |
| 99 | **(a)** | | | | | | | |
| 100 | **(a,c)**  Differentiating w.r.t. we get  Also, | | | | | | | |
| 101 | **(b,c,d)**  Let  Then, and  and  From Eqs. (i) and (ii) we get | | | | | | | |
| 102 | **(a,b,d)** | | | | | | | |
| 103 | **(a,b,c)**  Given, …(i)  On differentiating both sides w.r.t. , we get  Therefore, option (a) is correct.  Again, on differentiating both sides w.r.t. , we get  On dividing both sides by  Then,  or  Therefore, option (b) is correct.  Also, given  On differentiating both sides w.r.t. , we get  From Eq. (ii)  On differentiating both sides w.r.t. , we get  Now, on dividing both sides by  Then,  or  Therefore, option (c) is correct. | | | | | | | |
| 104 | **(a,b,c)**  We have  We have | | | | | | | |
| 105 | **(a,c)**  and are in A.P.  for all  Putting in (1)  We get  Putting  We get  (1)  Differentiating (1) w.r.t. | | | | | | | |
| 106 | **(b,d)**    (1)  Taking log of both sides, we get  Differentiating w.r.t. we get  Substituting the value of from (1), we get | | | | | | | |
| 107 | **(a,c,d)**  Also  Also | | | | | | | |
| 108 | **(b,c,d)**  Let  Then,  At | | | | | | | |
| 109 | **(a,c,d)**  Inas | | | | | | | |
| 110 | **(a)**  Given  and | | | | | | | |
| 111 | **(a)**  Since where  Taking lim as we get  (constant) | | | | | | | |
| 112 | **(a)**  (1)  Replace by (2)  From (1) and (2),  Replace by  Hence, both the statements are true and Statement 2 is correct explanation of Statement 1  Hence, is periodic with period 4 | | | | | | | |
| 113 | **(c)**  Fro ,  Let | | | | | | | |
| 114 | **(b)**  Both the statement are true, but Statement 2 is not correct explanation of Statement 1  Statement 1 is true as period of is  Or, in general if for we cannot say | | | | | | | |
| 115 | **(d)**  For | | | | | | | |
| 116 | **(d)**  Statement 2 is true as and then definitely is repeated root of  But from data, we are not sure how many times a root repeats  Also which changes sign at when is odd and does not if is even. Hence, Statement 1 is false | | | | | | | |
| 117 | **(a)**  Given,  Now,  Statement I is true, but II is false. | | | | | | | |
| 118 | **(a)** | | | | | | | |
| 119 | **(a)** | | | | | | | |
| 120 | **(c)**  Statement 1 is always true, but Statement 2 is not always true, as if then can be which is odd function, but if then is neither odd nor even | | | | | | | |
| 121 | **(a)**  Given  Put we get  Now, put we get  is an odd function  is an even function | | | | | | | |
| 122 | **(b)**  **a**.  at  **b**. Let us take  Thus,  **c**. Here  (1)  But  (2)  From (1) and (2),  **d**. obviously, is a linear function  Also from and | | | | | | | |
| 123 | **(a)**  **a**  Hence, graph of is symmetrical about point (1, 0) (as if then is odd its graph is symmetrical about (0, 0). Now shift the graph at (1,0))  **b**.  Replace by ,then  (1)  Graph of is symmetrical about line  Also, put in (1), we get  **c**. (1)  Replace by we get(2)  From (1) and (2), we have  Hence is periodic with period 4  Also, Hence is periodic with period 4  Put in we get  **d**. Putting we get  Putting  Diff. w.r.t. . we get  or  , because | | | | | | | |
| 124 | **(c)**  a. We know that  if or  b.  if  c.  ifof  d.  Now we know that ifandif  ifor | | | | | | | |
| 125 | **(a)**  **a. p,q,r**  The graph of    From the graph is negative for  **b. q,s**  The graph of    from the graph is negative for  **c. q,r**  =  Hence is negative for q, r  **d. q**  The graph of    From the graph is negative for q | | | | | | | |
| 126 | **(b)** | | | | | | | |
| 127 | **(c)**  Then, | | | | | | | |
| 128 | **(b)**  Suppose degree of then degree of and deg  So  Hence,  So put (where )  From  We have  Comparing coefficients of terms, we have  which is clearly one-one and onto  Also,  Hence sum of roots of equation is zero | | | | | | | |
| 129 | **(d)**  Here,  Put (1)  or  (2)  or  (3)  or  (4)  From(1)and(4),  From(1),(2) and (3), we have | | | | | | | |
| 130 | **(b)**  From the given information, we have where is polynomial of degree  Then is common root for the equations  Where represent rth derivative of w.r.t. | | | | | | | |
| 131 | **(b)**  Since are roots of then  (1) | | | | | | | |
| 132 | **(b)**  Here put (1)  Then  and  Hence, (2)  (3)  From (1), (2) and (3), we have  and  and  Hence, and So, and  is defined if | | | | | | | |
| 133 | **(d)**  (1)  (differentiating w.r.t. keeping as constant)  Put  Now put in (1), we get  Hence, three roots  is defined if or  Also, | | | | | | | |
| 134 | **(d)**  (1)  From equations (1) and (2)  Also,  Also, | | | | | | | |
| 135 | **(2)**  Limit is where | | | | | | | |
| 136 | **(5)**  According to question  and  and  or and or  hence and  Or and | | | | | | | |
| 137 | **(3)**  Hence and | | | | | | | |
| 138 | **(5)**  According to the question, | | | | | | | |
| 139 | **(7)**  can be finite if  and | | | | | | | |
| 140 | **(2)**  Since is odd. Therefore | | | | | | | |
| 141 | **(9)**  and  constant | | | | | | | |
| 142 | **(9)**  as | | | | | | | |
| 143 | **(6)** | | | | | | | |
| 144 | **(5)**  Now | | | | | | | |
| 145 | **(9)**  Let degree of is degree of  degree of is  Hence  Hence | | | | | | | |
| 146 | **(3)**  Given  Then | | | | | | | |
| 147 | **(1)** | | | | | | | |
| 148 | **(2)**  We have (1)  On differentiating equation (2) w.r.t. we get  (2)  Again differentiating equation (2) w.r.t. we get  (3)  Hence | | | | | | | |
| 149 | **(3)**  We have | | | | | | | |
| 150 | **(8)**    (all other factors except the last vanishes when | | | | | | | |
| 151 | **(5)**  We have  When  Hence | | | | | | | |
| 152 | **(5)**  Here is a repeated root of the equation hence is also a root of the equation i.e.,  Or or  has the root once which can be either , or 1  If then gives or  If then gives | | | | | | | |